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EDITORIAL

POULTRY

As we go to press there has just ended the Ninth World's Poultry Congress, which met in Paris. A World's Poultry Congress, sponsored by the World's Poultry Science Association, has met every three years, with the exception of the war period, since 1921: the fourth meeting was held in London in 1930 when the venue was the Crystal Palace. The aim of these Congresses, in the words of the President, are "to promote friendly relationship among all peoples interested in poultry farming and to encourage international contacts, of stimulating scientific research and the instruction of poultry farming by means of reports, discussions and expositions, to encourage production, commerce, and consumption of poultry products on a national and international level"; and also "to spread throughout the whole world the interests poultry farming represents and to attract the attention of all those interested in breeding to the most modern and rational methods used in different countries of the world."

There is always much to be learned from international congresses for during the interval between them, information on some of the important aspects of the subject of the congress has accumulated and is expounded and discussed by interested members present. The proceedings of this congress were no exception and some of the papers presented to the five sections, which met on each of the five days, were certainly of much value. To veterinarians, the section dealing with "the investigation of diseases and their control" naturally received most attention. A session was given to a discussion on Newcastle disease when contributions were made by workers in different countries, including an important paper from Great Britain on the introduction of the disease by frozen poultry carcases. Newcastle is being controlled to-day in many countries by vaccination,

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although the policy in this country and in some others is "stamping-out" by slaughter of infected and contact birds coupled with restrictions of movement of poultry. Salmonella infections, especially pullorum disease, also received a considerable amount of attention and a plea was made for international standardisation of antigens, techniques and interpretation of results in the testing of adult fowls for the diagnosis of carriers. It came as a surprise to find that in one country buccal vaccinations, i.e., the administration of vaccine by mouth, is used by at least one veterinarian in the control of pullorum disease.

The control of coccidiosis in poultry gave rise to some discussion following a paper from Great Britain on the use of sulphaquinoxaline for the treatment of cæcal coccidiosis. Highly satisfactory results were recorded from the feeding of this drug in the food at a level of 0.05 per cent for a continuous period of seven days or intermittently at intervals over a longer period. Attention was drawn to the ill-effects which might follow overdosing.

An important contribution to the subject of the transference of immunity via the egg in which agglutinating and non-agglutinating antibodies were studied came from Great Britain. This is work of a fundamental type which demands much careful investigation and which may lead to new methods of disease control. The paper, also from Great Britain, on Moniliasis in turkeys drew attention to the dangers of certain fungi as causes of disease and the possible danger of others.

Nutrition of poultry was the subject of many papers and much discussion. The items discussed included the use of antibiotics in poultry foods and the sources and value of the animal protein factor. There is no doubt that the nutrition of poultry is one of the important parts in the economy of the poultry industry and that it is receiving the attention which it merits. An interesting contribution was on the chemical caponising of cockerels by the use of hexœstrol in which it was shown that a carcase of superior quality was obtained from treated birds when fed on the foodstuffs at present available. The cause of "green yolks" was dealt with and was shown to be associated with the presence of a pigment, probably a chlorophyll derivative.

Artificial insemination of poultry is now a practical proposition and is being practised in some countries. Various techniques are in operation and further work is required to adapt them to the large-scale application which might be involved. The recent investigations carried out in this country on the preservation of fowl semen at low temperature is a fine contribution to the breeding of poultry by the practice of artificial insemination.

From this short description it will be seen that the veterinary aspects of poultry husbandry and health are receiving attention throughout the world: this is as it should be for the poultry industry is extensive and valuable and without healthy stock maximum production yields are impossible.

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SPECIAL ARTICLE

HISTORY OF THE VETERINARY PROFESSION 1851—1951—*(Continued)*.

The Changing Face of Imminent Veterinary Problems depending upon Periodic and Local Variations in the Domesticated Species of Animals both as regards (a) the Relative Importance of the Different Species, and (b) the Prevalence among them of Different Diseases *(continued)*

By J. T. EDWARDS, D.Sc., M.R.C.V.S.

(i) *"These contagious fevers are like Fire, very easy to put out when you have only to deal with the first spark: very difficult to put out when the spark has grown to conflagration."* Dr. William Budd, M.D., Clifton, in a letter to the Bristol Board of Health (quoted as motto by him in an article entitled, *"The Siberian Cattle Plague . . ."* in *The Veterinarian*, 1865, *38*, 695).

(ii) *"Est adhuc alia medicinæ praxis, quam veterinariam vocant, quæ brutorum morbis medetur, cæteris longe certior et utilior. Hanc tamen annulati isti medici non tam verecundiæ sibi ducunt, quam penitus quoque ignorant et aspernantur, admodum delicatuli, ut tanquam upupa axis, non nisi humanis stercoribus oblectentur. Unde si quis ab illis pro asino aut bove suo medicinam requirat, pro remedia mox injuriam accepturus sit: quasi ad eos non pertineat scire, non solum hominibus, sed etiam cæteris animalibus mederi. . . ."* H. S. Agrippæ, ab Nettesheim, *"De Incertitudine et Vanitate Scientiarium,"* chap. 87. [A 17th century treatise: the passage is quoted as motto by Heusinger, J. C. F. (1853), *Recherches de Pathologie Comparée*, Vol. 1 (published at Cassel). (Brit. Mus., No. 7440, f. 24.)] * See page 321.

I

"One of the difficulties of an attempt to write the social as distinct from the political history of a nation," writes Dr. G. M. Trevelyan (1945) in his *English Social History* (p. 551), "is the absence of determining events and positive dates by which the course of things can be charted. The social customs of men and women, particularly in modern times, are always in movement, but they never change completely or all at once . . ." In one sense, this statement applies also to veterinary history. As the late William Hunting remarked editorially in *The Veterinary Record* many years ago, one would have the greatest difficulty in tracing in our periodical literature when certain changes, such as the abandonment of blood-letting as a form of treatment, for example, took place in current veterinary practice.

But there are other senses in which the statement does not apply. It certainly does not apply, for example, to our organisation as a profession or to veterinary education, in which there are (as we have already said) conspicuous landmarks. And so far as concerns the evolution of veterinary preventive medicine, one soon finds that a chief difficultly in making a proper study of it is to be thoroughly satisfied that the chronology given in the writings of previous authors is correct beyond dispute.

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II

At the beginning of the preceding instalment we quoted a passage from an address delivered by John Gamgee on August 9, 1867, in which he said this country had suffered during the preceding quarter of a century from "*an extraordinary epizootic influence*" (his italics). He attributed its origin to Sir Robert Peel's Government (1841-46) throwing open our ports to the importation of foreign cattle and the lack of preparedness of the veterinary profession for many years afterwards to cope with the situation that had consequently arisen.

Since an Order in Council passed in 1770 had prohibited the importation of foreign stock [and during the Napoleonic wars (1793-1815), in any case, tradè with the continent in that commodity would have been suspended] the farm livestock of Britain had been remarkably healthy.

Then, as herald of the evil "*influence*" that was to overwhelm that stock during several decades, foot-and-mouth disease made its first appearance in these islands in 1839, and contagious bovine pleuro-pneumonia in 1842. Sheep-pox appeared again in 1847; swine fever was recognised in 1862, and, to crown all, and represent what is undoubtedly the greatest single episode in animal disease in this country within the whole century under review, cattle plague (rinderpest, or "steppe murrain") made its appearance again in 1865, after a long interval, extending back to the middle of the 18th century.

Now, let it be said at once, that it is in relating the first incursion of Gamgee's "*influence*" that is, in 1839, to his statement ascribing its origin and source that we have some difficulty. Quite apart from the historical interest of unravelling this difficulty, this matter is clearly of profound importance as a study in veterinary preventive medicine. We would further venture to add that no one who has not exerted himself to master all the evidence regarding the successive epizootic states of these islands since the opening of the 18th century, and upon which there is a wealth of recorded testimony, can rightly put forth any pretensions to speak with authority upon veterinary preventive medicine as it applies to Britain, and still less to teach the subject properly to students. Indeed, we would go still further by asserting that unless, in the Lancisi-Bates-Layard-Gamgee-George Brown tradition, a man has to his credit some real achievement in the practice of veterinary preventive medicine, it is a subject upon which, on the whole, it would be wise for him to remain silent, so disastrous and costly to the livestock economy of the country, as we shall have cause now to indicate, being otherwise resort to the counsels of those who are unversed in the actual practice of that branch of medicine.

With the better knowledge we now have upon the ætiology of the several epizootics that invaded these islands after a long period of relative freedom from severe infection, we can well understand that in the case of some of them, such as foot-and-mouth disease and swine fever, direct importation, with diseased animals, would not be necessary; whereas, with others, such as cattle plague and pleuro-pneumonia the chances of establishing infection here other than through importation of diseased animals would be small. Smith says, in his short biography of John Gamgee (*Hist. Vet. Lit.*, Vol. 4, p. 149) that "in reply to the

FIG. 1

Photograph (reduced one-fifth) of map in Appendix I of Cattle Plague Commissioners, showing the prevalence of cattle plague from its commencement, in June, 1865, until the end of December, 1866. The note on it says: "The relative proportion of Attacks to the estimated ordinary Stock in each County, is expressed by the densities of the Shading. Thus, in Cheshire, where the number of Attacks was 68 in every 100 Cattle, the Shade is deepest. The date [too faint to be recognisable in the reproduction] indicates the first reported outbreak in the County, and the figures the per Centage of Attacks." It will be noticed that all the counties of Wales (except Denbigh and Flint), Westmorland, and the Westernmost and Northernmost Scottish counties (Wigtown, Argyll and Bute, Ross and Cromarty, Sutherland, Caithness, Nairn, Elgin and Banff) escaped attack altogether.

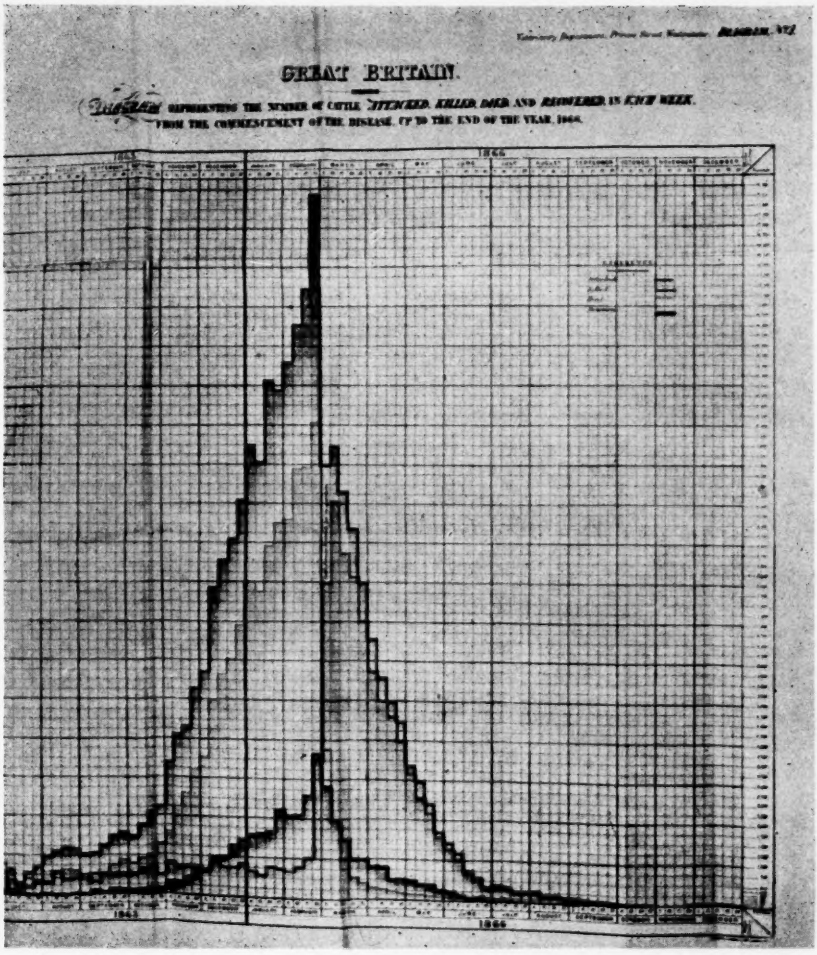

FIG. 2

In the original, the four separate curves depicted in the diagram are drawn in different colours. Hence, in the photographic reproduction (reduced about one-fifth) the separate curves are not very easily distinguishable. The tallest curve shows the number of fresh cattle attacked weekly and it rises to nearly 18,000 during the week ending February 24, 1866, dropping abruptly to 11,000 during the next week, after the Cattle Diseases Prevention Act had been put into operation. Thereafter, there is a precipitous steady drop till the last week of June, when the number attacked fell to about 300. The disease lingered on afterwards until its final extinction over a year later, on September 3, 1867 (partly because of some relaxation probably in the application of the Act and partly, too, because of its persistence in sheep, which acted as reservoirs of the virus. The lowest curve, also deep black, indicates the weekly recoveries. The other two curves, tinted respectively yellow and green in the original, are not well differentiated in the photograph. But the fainter of the two, which rises sharply towards the left just below and in close proximity to the tallest curve, indicates the number of cattle reported dead weekly. The darker curve, indicating the number killed, remains relatively low until the first week of March, 1866, when the Cattle Diseases Prevention Act came into operation. It then rises abruptly to 8,000 that week and just over 10,000 during the following week. Thereafter it is almost superimposed on the rapidly-falling curve showing the number attacked. Such as it is, with all the imperfections in reproduction, the figure, we hope, will furnish the reader with the essential evidence we would wish to bring before him. For the first time, and for all time, the data given demonstrated the efficacy of the Stamping-out System in the eradication of cattle plague in the eminently favourable circumstances of these islands.

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FIG. 3

There is unfortunately no photographic record of the devastation caused by the British cattle-plague epizootic of 1865-67. Hence, to give the present-day reader an impression of the aspect of a countryside when cattle plague has swept through it, we reproduce the photograph published by our esteemed South African colleagues, Drs. P. J. Du Toit and Cecil Jackson, depicting a "pathetic scene" in the great South African epizootic of 1896-97 (*Jl. S. African V.M.A.*, 1936, *7*, 166—issue to commemorate the life and work of Sir Arnold Theiler).

demand for free trade in foreign cattle, the Government in 1838 had thrown open the ports to free trade in contagious animal diseases! Foot-and-mouth disease was the first to arrive; then, while this was creating havoc, contagious pleuro-pneumonia, and later sheep-pox, came in. There was no preventive veterinary service. An old Act dealing with sheep-pox was in existence, but was perfectly useless . . . " We have not been able to rest satisfied that this statement, written only shortly before Smith's death, can be accepted as wholly true. Indeed, in his penetrating criticism upon Simonds (*loc. cit.*, p. 85), whom he consigns to the execration of posterity for his culpable lack of insight and foresight in respect to the whole dread situation that came to befall the country, he had already said that it was " in 1841, it (the British Government) had thrown open the country to the free importation of cattle from abroad."

Writing upon the introduction of pleuro-pneumonia into this country, Fleming (*Animal Plagues,* Vol. 2, 1882, p. 487) states: " We have in previous years alluded to its prevalence in (Holland) and other countries, and to such an extent and in such close proximity to our own shores, that we can scarcely be surprised to find it in England, where its presence was not suspected until it had made considerable progress. From what source it was derived has not been satisfactorily determined; indeed, its previous history appears to have been altogether unknown here, and its existence on the Continent quite overlooked for some time. The trade in foreign cattle had been increasing, and the importations of stock of all kinds from many sources was considerable, even previous to July 9, 1842, when their admission at a small rate per head was allowed by Act of Parliament. This trade was doubtless the cause of the introduction of the foot-and-mouth disease, and that now under consideration." Fleming goes on to say, writing as he was doing in 1882: " The continuation of this traffic on such an extensive scale, and without proper, or any precautions, has kept Britain supplied with fresh

* This passage printed in Heusinger's classic work on veterinary history is reproduced by George Fleming (*Veterinarian,* 1867, *40,* 563) in an article written to rebut a taunt levelled at the veterinary profession by the editor of *The Lancet* (1867, May 25). The appointment of qualified veterinary surgeons to implement the provisions of the successive Orders in Council and the Contagious Diseases (Animals) Act, 1866, enacted during the great cattle-plague epizootic of 1865-67 in Britain, based on the Reports of the Cattle Plague Commissioners, had induced the editor to publish the following comment: ". . . The laws regulating the extension of the disease are pretty well ascertained, but there is little indication that these are taken into account by many of the inspectors acting under the Privy Council. It is of no use to enlarge the powers of the inspectors, as the Government purposes to do, unless these are exercised promptly, and unless the inspectors appointed are really familiar with recent investigations. *It would be satisfactory to see regular medical men of high scientific standing appointed as inspectors, at least temporarily. This is the only practical way of utilising the investigations of the Commissioners.*"

The Latin passage can be translated as follows: " There is, moreover, another type of medical practice, designated as veterinary, which treats of the diseases of animals, but is far more sure and useful than all the rest. Those ring-wearing (i.e., dainty-fingered) physicians do not so much look upon that type of practice with a natural feeling of shame as that they ignore it altogether and hold it in contempt, being squeamish in that respect to a degree. So that, like the hoopoe-bird, they delight only in human ordure. And so it comes to pass that if one asks them to prescribe a remedy for an ass or an ox they quickly accept the request as an affront: as if it was no business of theirs to be versed in the treatment, not alone of human beings, but also of other animals."

" The force and point of this quaint observation," Fleming says, " at this present day [that is, in 1867] cannot be gainsaid." Neither can it be wholly ignored the reader will be tempted to add, we feel sure, at this, *our own,* present day.

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instalments of the contagium from the infected centres abroad. Before the development of the cattle trade, the cattle and sheep of this country had been, as our history testified, remarkably healthy, and the sudden and widespread manifestations of such serious maladies caused surprise and alarm among agriculturists, no less than among veterinary surgeons". Fleming's statement, at any rate, gives us some more satisfying evidence as to the precise date when livestock importation was officially permitted. An excellent summary of the first introduction of foot-and-mouth disease was given by Smith in this Journal shortly after the severe visitation of 1924 (*Vet. Jl.*, 1925, *81*, 35).

III

Complete "free trade" did not come about, as we well know, until the Act for the Repeal of the Corn Laws, which was passed just before Peel left office in 1846. But, since he had assumed office in 1841, he had pursued a policy of encouraging trade and lowering costs by removing the irksome duties that had been imposed since the beginning of the century. Much was made by "free-traders" after his day, assuming as they did that the apparent prosperity which was being enjoyed could be traced to the removal of barriers against the free importation of food, of what came to be known as "the hungry 'forties." "'The 'forties were not altogether hungry,' as the saying has it," says, however, a distinguished modern historian (Feiling, Keith, 1950, *A History of England*, p. 845). And he continues: "On the contrary, though 1847 was a dire year" [the year of the Irish potato famine] "with that exception progress was decidedly towards that greater cheapness of living at which Peel aimed. Exports were valued at £47 millions in 1842, but at £60 millions in 1845; 5,000 *live animals were imported in* 1842, *but* 216,000 *in* 1847 (our italics); the growth in cotton and iron was portentous, and of coal great, though not so fast. The harvest of 1844 was the best for ten years, over the whole 'forties wheat averaged just under 56s. a quarter and fell to 45s. in part of 1845; with the familiar exception of dying trades like hand-loom weavers and hosiery knitters, real wages in industry as a whole had risen, perhaps by something between 20 and 30 per cent. When Peel left office, in fact, after two fluctuating and hard-tried generations, the cost of living had been restored to much the same level as before the great war [i.e., the war of 1793-1815]."

"If Nature, and Nature's recovery when man allows her, had assisted in this, man's invention and Peel's faculty for the minimum of sensible reform had contributed too. Cheapness, for one thing, was a child of cheaper transportation . . ." [which, we may add, was soon to make itself felt also in the "cheaper" transportation internally of epizootics, once they had obtained ingress into this country from abroad].

The quotation given above may seem, at first sight, irrelevant and redundant to our purpose in writing upon an episode in veterinary history. However, close study of what was to follow, from yielding to the popular clamour for "free trade," not only, after a lapse of nearly thirty years, brought about, as it did in 1875, the ruin of a finely-built agricultural system, but also, sooner, in 1865

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came within an ace of wiping out the finest livestock economy the world had ever seen. That it did not do so, the nation has to thank a few wise and public-spirited men who were then to be found in the veterinary profession. Two men, one belonging to that profession, namely John Gamgee, and another belonging to the medical profession, namely William Budd, of Bristol, stand out conspicuously (as William Hunting, who was a witness of events, afterwards declared publicly) as gifted and clear-sighted individuals among contemporaries who, for the most part, had to be forced by the inexorable consequences of their dilatoriness and, often, cupidity, to take the only proper action *for this country,* which was to " stamp out " the diseases energetically.

IV

Writing editorially in *The Veterinarian* (*42*, 919) late in 1869, well after the cattle plague epizootic had been successfully mastered, the enlightened writer [probably G. T. (later Sir George) Brown (1827-1906), who was afterwards destined, from 1872 to 1893, " to lay the foundation of the present effective structure " (Smith) of our State Veterinary Service] comments upon the considerable extension of foot-and-mouth disease over a considerable part of the kingdom. " Indeed," he says, " only two counties in England have escaped, while a large portion of Scotland and Wales have suffered, and Ireland is now experiencing the beginning of the trouble." " Pleuro-pneumonia," he adds, " exists in thirty-four counties of England, Scotland, and Wales, and in Ireland it is reported to be extensively prevalent. Scab in sheep—a very annoying though not a fatal disease—exists in several places, and glanders in horses is far more common than many people suspect." Then follows a passage which has not been surpassed for the expression it gives to the kind of experience which can only be gained by the observant, *working* epizootiologist: " To the ætiologist the spread of these maladies at certain periods is a fact not easily accounted for; in the course of his investigations he sometimes discovers centres of infection, from which, however, no real influence appears to radiate, until suddenly new conditions arise, and the affection extends over the country with wonderful rapidity. Quite unsuccessfully the inquirer seeks to ascertain the nature of these new circumstances, nothing of a tangible character rewards his search; so far as he can see, all the essential features of the disease remain as they always were; but instead of the affection advancing only in consequence of direct contact, it seems to have acquired an excess of malignancy, and to proceed in defiance of laws, and regardless of all attempts to arrest its progress by sanitary means . . ."

" . . . That foot-and-mouth disease and pleuro-pneumonia are exclusively of foreign origin," he then adds pertinently, " and due to the importation of foreign stock, is an article of faith so firmly established in the agricultural mind that to oppose it, or even to venture upon a suggestion to the contrary, is now a hopeless task. *Nevertheless, we must, in passing, plead the well-known fact, that foot-and-mouth disease appeared in England, and pleuro-pneumonia in Ireland some years before foreign stock were admitted. It is said that animals were landed from the Continent both in England and Ireland before 1842, but,*

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after careful inquiry, we have failed to discover any reliable evidence of the truth of the statement . . ." (our italics.)

And so it came about that there was no escape from the conclusion that quite independently of dealing with these diseases by resort to measures aimed only at the elimination of risks through importation of diseased stock, steps must be taken drastically to suppress their perpetuation within the country itself. "We have never hesitated to express our conviction," the writer says, "that a separate waterside market for the sale and slaughter of all imported animals would not prevent pleuro-pneumonia and foot-and-mouth disease in this kingdom; both of them have been too long established to yield to preventive measures of so very indirect a kind; and if they are to be eradicated, they must be dealt with quite independently of foreign importations . . ." The reader, in any case, will now appreciate why we have been slow to accept as valid testimony much of what has been put forth as established fact in the literature.

V

Smith, in the statement quoted above, was grievously in error in referring to the existence of "an old Act dealing with sheep pox" at the time of the first visitations, from 1839 onwards. The error is surprising because in his very accurate account of Simonds's (*Hist. Vet. Lit.*, Vol. 4, p. 98) original diagnosis of sheep pox, among a flock at Windsor in September, 1847, he explains how, "in despair," Simonds, "addressed the Government, stating that unless active measures were at once taken the flocks of this country would be decimated. An Act of Parliament was passed in September, 1848, which gave authority for the destruction of affected animals entering this country. Up to that date unbelievable as it may be—the Customs authorities were powerless to destroy the animals which were found to be affected when landed, or to prevent a contaminated flock from being landed . . ." That Act was indeed the only Act in existence dealing with the contagious diseases of animals when cattle plague invaded the country in 1865. [See *Reports of Cattle Plague Commissioners,* First Report, dated October 3, 1865, section 4, p. xii; Report on the Cattle Plague in Great Britain during the years 1865, 1866, and 1867, with Appendix—p. 353 (Digest of Acts of Parliament and of Orders, etc.)] After cattle plague had declared itself at the Metropolitan Cattle Market on June 19, 1865, it was under this "old Act" that the first Order in Council was issued on July 24 ("14 days after the first notice of the outbreak was given by Professor Simonds at the Privy Council office"). It was this delay of over a month before the first steps were taken that contributed to the widespread initial dissemination of the disease. The Royal Commission was appointed on September 29, 1865. The First Report, dated the following October, hesitated to recommend the drastic measures necessary for the suppression of the disease. In face of failure to make any impression on its progress, the Second Report, dated February 5, 1866, declared (p. viii): "The only means of combating the disease which remain consist in the stoppage of the movement of stock and of things likely to be vehicles of infection, in the isolation and slaughter of infected cattle, and in the use of disinfectants."

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Consequently (see Appendix III, last report, p. 358) " on February 20, 1866, an Act, intituled ' An Act to amend the Law relating to Contagious or Infectious Diseases in Cattle and other Animals,' and to be called The Cattle Diseases Prevention Act, 1866 (28 and 29 Vict. c.2) came into force." It would be no exaggeration to say that *that date represents the " zero hour " of the State Veterinary Service in this country.* It had needed the dire calamity of a visitation of cattle plague to move authority to enact it; the preceding visitations, of foot-and-mouth disease and pleuro-pneumonia, grave as the losses sustained from them had continued to be, had entirely failed to move Government to take action. We shall need to dwell upon that failure again, because, in fairness, to a large extent, the reluctance to take State action had been entirely in accord with the prevailing, and (up to a point) wholesome British idea to interfere as little as possible with domestic matters affecting particular sectional interests. But to no small extent, as Smith has very rightly insisted (*Hist. Vet. Lit., 4,* 95), the failure to implement proposals for effective legislation mooted as far back as 1857 must be laid at the door of Simonds, who, too, had further lulled the country into a state of false security after a mission that same year to the Continent on behalf of the Royal Agricultural Society of England (which had rightly had reason to feel apprehensive in view of the spread there of disease). It was Gamgee who, meanwhile, had preached upon the certain dangers of direct importation from the great enzootic tracts (the steppes) of Russia by way of the Baltic ports, summoning, moreover, the First International Veterinary Congress held in Hamburg in 1863 for the purpose and endeavouring to put through Parliament next year the necessary preventive legislation. Eventually, the plague was introduced in exactly the manner predicted by Gamgee, and again, largely through Simonds' failure to diagnose it at once, it obtained a costly foothold in the country.

Anyhow, as is evident from the photographed reproductions of the map and one of the diagrams accompanying the last report, the effects of the Act of 1866 were striking and immediate. There could remain, from that moment onwards, no doubt whatsoever that in the peculiar circumstances of this island the most effective and most economical procedure for employment to suppress cattle plague—and presumably any epizootic disease exhibiting similar features—was the rigid application of the " stamping-out method."

That the disease did not disappear completely within a very short time after the application of what came afterwards to be known as " Cattle Plague Measures," but lingered on for several months, seems to have been due to the hold it had established already in the country, particularly in species other than the bovine, namely, goats and sheep. The strain of virus in the epizootic, although it showed some affinity for these species, did not appear to be so highly adapted to them that there was any risk of their becoming a permanent reservoir of infection. That is evident from the figures given below from the reports. The morbidity and mortality rate among sheep did not differ sensibly from that registered in cattle, but the epizooticity among them was far lower.

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THE GREAT CATTLE PLAGUE EPIZOOTIC IN BRITAIN, 1865-67.
(Figures taken from the Reports of the Cattle Plague Commissioners, App. I, pp. 46 and 194)

(A) Stock of Cattle (enumerated March 5, 1866)	4,785,836
Dates of (*a*) First Outbreak ...	June 24, 1865
(*b*) Last Outbreak ...	September 3, 1867
Total number of:	
(a) Farms, sheds, or other places in which the disease appeared for the first time	27,838
(b) Farms, etc., revisited by the plague after having been free for 21 days	1,432
(c) Cattle on farms, sheds, or other places where the disease appeared	470,172
(d) Healthy cattle slaughtered to prevent the spread of the disease	57,068
Total number of cattle:	
(a) Attacked by the disease	278,756
(b) Killed	99,961
(c) Died	133,477
(b) Recovered	40,182
(e) Unaccounted for	5,116
PERCENTAGE OF	
(a) *Attacks* on estimated ordinary stock of cattle ...	*5.8*
(b) *Killed*	*2.1*
(c) *Died*	*2.8*
(d) *Recoveries among attacked*	*14.4*
(B) Stock of sheep (enumerated March 5, 1866) (App. I, p. 224)	22,048,281
Whole of cases were reported from August 11, 1865, to September 29, 1866	
Total number of:	
(a) Farms, studs, or other places in which the disease appeared among sheep	115
(b) Sheep slaughtered healthy to prevent the spread of the disease	434
(c) Sheep attacked by the disease	7,754
(d) Diseased sheep killed	1,186
(e) Diseased sheep died	5,343
(f) Diseased sheep recovered	1,162
(a) *Percentage of attacks* on estimated ordinary stock of sheep	*0.035*
(b) *Recoveries among attacked*	*15.1*

VI

It would not be fair, in a single essay, to strain the attention of the ordinary reader beyond making it quite plain to him what was the actual origin of our

Stamping-out Policy for dealing with the graver epizootic diseases—a policy which the reader will now have no reason to doubt, its being based on evidence as "scientific" as any ever placed on record.

Smith says (*Hist. Vet. Lit.*, Vol. 4, p. 131): "To George Brown belongs the whole credit of our efficient civil veterinary organisation," and thanks to him, "the recrudescence of Cattle Plague in 1872 and 1877" was stamped out at trifling cost. The Act of 1866, having proved itself strikingly efficacious in the suppression of cattle plague, was soon amplified, in 1869, by the passing of another Act to embrace, besides cattle plague, the other common epizootics, "pleuro-pneumonia, foot-and-mouth disease, sheep-pox, sheep-scab, and glanders, and any disease which the Privy Council from time to time declare to be a contagious or infectious disease for the purposes of this Act." It was a long time, however, before the necessary further provisions were enacted to cope effectively with these other diseases. A much improved Act was passed in 1878. Curiously, in 1887, foot-and-mouth disease suddenly disappeared from the country. "The year 1891 was historic. The Pleuro-pneumonia Act of 1890 came into force on September 1, and by the end of 1891 it was evident that victory had been won. Incidentally, we learned much about another disease, tuberculosis. Every case of pleuro-pneumonia had to be examined *post mortem*, and this gave an opportunity of collecting precise data on tuberculosis. Cows were found to be affected in the proportion of 16.09 per cent; of bulls only 1.53 per cent were infected" (Smith). Very soon, however, the tuberculin test was destined to provide us with more extensive and precise information. To a veterinary surgeon in practice at the present day, the following passages, written by Professor Walley, of Edinburgh, as a preface to his standard book, published in 1879, entitled "*The Four Bovine Scourges*," makes strange reading:—

"The author has on various occasions, and by numerous friends, been asked to publish a work on Cattle Pathology. From the many claims on his time and energies, he has been quite unable to comply with their request. In the publication of the present work, he hopes to partially meet their wishes.

"He has chosen the four diseases—Pleuro-pneumonia, Eczema Epizootica [the name then often applied to foot-and-mouth disease], Cattle Plague, and Tubercle, for his Subjects; knowing as he does, that they are of more importance to the stockowner than all the other ills to which bovine flesh is heir.

"The three first-mentioned diseases are only too well known, the last is less perfectly so, even, it may be said, to Veterinary Surgeons. . . .

"Those who know nothing of Tubercle may question its claim to a place amongst what may be called the bovine scourges, but as will be seen on studying it, it is more insidious (and equally deadly) for the stockowner than either of the other three diseases. . . ."

At that date, as will be noted, it needed an apology to stress the relative importance of bovine tuberculosis on the attention of the practising veterinary surgeon, and hardly anything was heard about those other topics on which since then we have become all too familiar, such as abortion, mastitis, and sterility.

At the Third International Veterinary Congress, that had been held in Zurich, on September 2 to 8, 1867, the programme, significantly again, contained five items only: (1) Rinderpest (cattle plague), (2) Pleuro-pneumonia, (3) Meat inspection, (4) Veterinary education, and (5) Organisation of veterinary medicine by the Government of the State. Readers cannot fail to be impressed by the great change in general topics entered on the programme of the Fourteenth Congress, held in London in 1949, as well as the greater diversity of subjects chosen for discussion.

It is significant, too, that before he finally left the veterinary scene, John Gamgee, in 1871, "began the publication of the *Milk Journal, a Monthly Review of the Dairy,* in London." We owe this information to the late Dr. Fred Bullock (Smith's *Hist. Vet. Lit., 4,* 148, footnote). Already, in 1861, he had published a work, "*Dairy Stock, its Selection, Diseases, Produce, etc.,*" which clearly shows him to be the pioneer in arousing the interest of the profession in a field of work which since then has provided it with a major source of employment.

As it happened, the great Cattle Plague Epizootic of 1865-67 proved in several ways a blessing to our profession and to the country. Not only did it precipitate much-needed legislation to control, for the first time, animal disease and lead to the creation of a well-organised State Veterinary Service, but it provided most precious information upon the epizootic status of the different geographic regions of the country after a severe visitation of contagious disease was allowed to spread almost unhampered, as the cattle plague was allowed to do before its progress was abruptly halted when the Act of 1866 was enforced. A glance at the different intensities of shading on the map reproduced, representing as they do the different regional incidences of attack, will soon strike the reader with their close correspondence to the distribution of some other diseases that have since then prevailed. The very deep shading of the Cheshire area, for example, not only corresponds with the exceptionally high incidence of attack during the severe foot-and-mouth disease epizootic that occurred shortly after the First World War, but also with the worst of the "storm centres" of those much more insidious infections that have now come to dominate the scene, namely, brucellosis and tuberculosis. The very high death rate in a disease like cattle plague is, paradoxically, an advantage, for as will be seen from the tabulated figures, even though Government was tardy in taking action, the total loss of cattle fell below six per cent, and authority was prompted to act to remove the menace for good and all, in quick time. That has notoriously not been the case with tuberculosis. The state of agriculture was never so flourishing as when the great cattle plague epizootic broke out among our herds, and so the public interested could well afford to withstand the financial losses.

With the subsequent Pleuro-pneumonia experience after the Act of 1890 conclusively showing the value of the stamping-out method as applied to that disease, the Act of 1894 is the next great landmark in veterinary preventive medicine in Britain, when similar provisions were made at last to deal with Foot-and-mouth disease. In spite of the shocks which that Act had to withstand

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in 1912 and again in 1924, it has stood inviolate as our bulwark against the great epizootics ever again afflicting our cattle. The Consolidation of the successive Acts which has recently (1950) been achieved provides this country with a compact body of legislation second to none in the world.

VII

Why it had been impossible to achieve in the case of the apparently less severe epizootics that had obtained a foothold a couple of decades earlier in the country what was achieved in 1866 in the case of Cattle Plague deserves some further attention. After close study of the ample detailed information available bearing upon this point, we feel the situation could not possibly be better expressed than it was by Fleming, writing in 1874, in his introduction to his valuable book, "*A Manual of Veterinary Sanitary Science and Police*":—

"In this country," Fleming says, "up to the invasion of the Cattle Plague in 1865, it may be justly said that Veterinary Sanitary Science, except in the Army, had no existence, so far as the prevention of contagious diseases is concerned. Though, since 1839, grave losses were annually sustained from the unchecked prevalence of two exotic maladies—a loss amounting to many hundreds of thousands of pounds in some years—yet no measures were adopted, no organisation devised, to remedy this serious state of affairs. It was only when the Plague was introduced in 1865, and our entire stock was threatened to be swept off by that terrible malady, that the attention of legislators was forcibly directed to the danger incurred through our culpable negligence; and after the country had suffered a pecuniary loss of probably eight millions of pounds, and grave inconvenience and embarrassment during the two years that elapsed before it could be extinguished—through the absence of any kind of organisation—we had the existing Veterinary Department of the Privy Council constituted.*

"Up to 1869, for the thirty years that had elapsed since the introduction of the two contagious maladies—foot-and-mouth disease and bovine pleuro-pneumonia—it was estimated that the loss from these alone amounted to 5,549,780 head of cattle, roughly valued at £83,616,854. This is, of course, irrespective of the losses from cattle plague. There cannot be doubt that the same rate of loss has continued, if it has not largely increased, since that period. In 1872, for instance, from one malady only—foot-and-mouth disease—it was calculated that the money loss in Britain must have amounted to £13,000,000; but some authorities are of opinion that this is even under-estimated. In Ireland, for the same year, 220,570 cattle were reported by the police as affected with the disease; but this is undoubtedly only a tithe of the actual number, as a

* Here Fleming inserts a generous footnote, certainly not in keeping with the grudging lack of appreciation of other contemporaries: "It would be more than unjust," he says, "to omit the mention of Professor John Gamgee's name in connection with this subject. For several years previous to 1865, he lost no opportunity of drawing attention to the culpable negligence which exposed Britain to the very serious losses inflicted by preventable diseases among animals, and predicted the invasion of cattle plague which occurred in that year. This veterinarian at least deserves the honour of being designated the 'pioneer' of Veterinary Sanitary Science in this country."

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declaration of its existence is the exception, not the rule. Nevertheless, if we estimate the loss on each animal reported at £2 (though it may be nearer £4), we have £441,140 to be added to the above sum as the pecuniary loss incurred in the three kingdoms from the existence of one preventable malady only. The damage inflicted by contagious pleuro-pneumonia is probably not much less, as it is always prevalent; whereas the other is more diffused at some seasons than others.

"From this it will be seen that the prevalence of contagious diseases has not diminished since the Veterinary Department of the Privy Council was inaugurated, and it could not reasonably be expected that it would be otherwise. There is no efficient organisation to carry the legislative measures into effect—there is no central authority to impose one uniform action upon the local authorities; and these again have no competent instruments to carry out their orders. In 1873, of the 1,678 inspectors appointed by the local authorities in Great Britain, only 22 per cent were members of the veterinary profession; 59 per cent being members of the police force, and the remaining 19 per cent anything. And even the veterinary inspectors are in private practice—a circumstance which very materially detracts from their usefulness in their public capacity. . . ."

At that stage, a Committee was appointed to report on the applicability of the Contagious Diseases Act to foot-and-mouth disease, and some passages from their report now make strange reading: ". . . Your Committee have come to the conclusion that it is hopeless to attempt to extirpate, or even materially to check this disease, unless the above-mentioned stringent measures are strictly enforced; and they also believe that such enforcement would require a numerous and costly staff of inspectors, an amount of supervision by the central authority which would excite much local opposition, at any rate in Great Britain, and such an interference with the home trade in animals as would affect prices, and would induce, not only the consumer, but the producer to consider the remedy to be worse than the disease." After further argument this Committee recommended that the Privy Council should cease to issue orders for the check of this disease, and consequent upon their recommendations, an Order in Council was issued to take effect from and after August 31, 1873, which contained the statement: "Foot-and-mouth disease shall not be deemed to be a contagious or infectious disease within the meaning of either of the following articles of the Animals Order of 1871, namely, articles 19 and 27. Any regulations made by a local authority under the said article 27, as far as they relate to foot-and-mouth disease, are hereby revoked. . . ." We have now related how later, in 1894, legislation was at last enacted to deal effectively with this disease.

VIII

What there was to hinder the more general application of stamping-out measures becomes more evident when we study closely some of the other literature of the period. John Gamgee, in his classic book, "*The Cattle Plague*," published in 1866, had already had much the same story to tell (see p. 18) as

Fleming: "We shall never again," he says, referring to foot-and-mouth disease, "be altogether exempt from attacks of this disease, owing to the certainty of its regular introduction from abroad." But in regard to pleuro-pneumonia, or the lung disease, he insists upon adopting drastic measures for its extirpation. "Stop the lung disease," he says, "and the meat manufacture of the British Isles will again prosper."

In large part, no doubt, the vested interests of traders stood in the way. But, as has already been said, there was also a sincere reluctance on the part of Government, as interpreter of the wishes of the people, to interfere. Thus, after the outbreak of the cattle plague in 1865, the then Chancellor of the Exchequer, Mr. Gladstone, declared, in characteristic language, in a letter published on December 26, 1865 (Gamgee, *loc. cit.*, p. 158): "The difficulty, and not the difficulty only, but the impossibility of preventing carelessness, waste, and fraud of every kind, from the first moment it should become known that the ultimate responsibility (beyond a fixed limit, which would at once be found to be a very, very narrow one) lay with the public purse. . . . . Nothing could be so unfortunate as a measure like a State guarantee, which by relaxing vigilance and the ingenuity of self-interest, would tend to take the mind of men off a subject obviously of the greatest moment, and, as clearly, not sounded to the bottom. This objection does not apply to plans of a voluntary nature, where every man would be checked by his neighbours, and each scheme would have its proper adjustments. . . ." Inevitably, to resolve problems like those of the major epizootics, however, it became progressively clear that only the lesson taught by the great cattle-plague epizootic would ultimately apply.

Early in the 19th century, France had built up an adequate organisation to cope with any possible future intrusion of the cattle plague. Nevertheless, she despatched the illustrious Henri Bouley to witness at first hand the progress of the epizootic when it broke out in England, catching the country as it did unprepared. Reporting provisionally on his return to the French Imperial Academy of Medicine at its meeting of August 29, 1865 (*Veterinarian*, 1865, *38*, 714), he says: ". . . One may see in the metropolitan market in London every Monday cattle coming from Prussia, Austria, Podolia, Poland, Hungary. Spain, and France also, furnish their contingent. Of the 6,000 beasts in the London market, 3,000 at least are from foreign countries. England acts like a great sucker on Europe. It draws, for the consumption of its inhabitants, an immense quantity of animal food; and as the prices are remunerative, the dealers find it to their benefit to obtain it even from the Gulf of Finland: that is to say, from the Russian provinces, where typhus (i.e., cattle plague) is enzootic. The disease having once shown itself in the dairies of the metropolis, it soon spread in all directions, because, unfortunately, the Government was not armed with sufficient power to arrest its propagation. The proprietors of the sheds where it prevailed hurried their cows, which were not yet attacked, but which already carried the germ of the disease off to the market, and these animals have disseminated it in every direction. At the present time

the whole of Great Britain is invaded, and Scotland likewise. I have been enabled, in visiting the dairies in Edinburgh, to ascertain that the typhus had been introduced into that capital by cows bought in the London market. The Government has done all it could with the limited legal means at its disposal. The owners of diseased animals are obliged to give notice of their existence, and they are no longer allowed to move them from their premises without the authorisation of an inspector appointed by the Privy Council. But these measures have the great fault of being too late; and then they are insufficient and difficult in their application, on account of the feeling which prevails in England, and the resistance every Englishman always offers to the interference of Government in what he considers his own private concerns. *Everyone has the love of self-government in England, and more than one inspector has been refused admittance in what is considered sacred, namely, the home of the Englishman, in spite, or perhaps on account, of the official character with which he was invested. This liberty, which has its bright side, I will not contest, but under present circumstances it is pregnant with great disaster. . . .*" (Our italics.)

The question, at this date, remains whether by acceptance of the salutary lesson soon to be learned, and afterwards, in the course of time coming to apply it perhaps too generally, we have sacrificed something that was precious in the national spirit. That may not be quite so disturbing to the younger generation as it is to a member of an older one, who now stands bewildered at the costly and complex Civil Service organisations (Lord Hewart's "new despotism") built up supposedly to promote the public interest. Parenthetically, it is an odd circumstance that it was Mr. Gladstone himself who was soon to lay the foundations of an organised Civil Service as we now know it, soon after he had formed his first Ministry in 1870, creating its framework on the Chinese model.

Were space available, the writer would like to reproduce much more from the narrative of the above genial and brilliant Frenchman, so highly appreciative of the British character at its best. Having consecrated no small part of his own life to studying the means of extirpating the dread cattle plague from other lands, and finding now that in the changed climate of public opinion in England a powerful bureaucracy built up upon the foundations laid by the devotions of a few pioneers has come to reign supreme, which is discovering complaisant apostates in a prolific new generation of technologists, the present writer is given sometimes to wonder whether after all it was worth while suppressing cattle plague to raise up in its stead another kind of plague which Bouley noted a former generation of Englishmen were determined at all costs should not sap the moral fibre of the nation.

IX

The measures that came to be adopted for the suppression of cattle plague during the years 1866 and 1867 certainly brought about a diminution in the incidence of foot-and-mouth disease and pleuro-pneumonia almost to vanishing point, but quickly afterwards, in the following years, the prevalence of these

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two diseases rose again, as if their temporary suppression had caused them afterwards to rebound as soon as suppressive measures were relaxed. But, even that pointed observation failed to move authority for several years to widen the application of the drastic "cattle-plague measures" to extirpate those two diseases.

To conclude, for the present, this instalment, some passages from *The Field* newspaper (to which British veterinary medicine later, in 1922, was to lie under a debt of gratitude for inaugurating the fund which was soon to resolve the problem of canine distemper) deserves in tribute to it, at this moment, to be reproduced (see *The Veterinarian*, 1867, *40*, 155):—

"If the spirit of investigation," *The Field* said, "which the cattle plague has aroused be suffered to decline with the subsidence of the disease, one grand result will have been lost, and a valuable opportunity misused. If no great effort is made now to advance the study of animal pathology to a position far higher than it has yet attained, the omission will hereafter be deplored. . . . Whether veterinary science has done more or less than it should have done, we are content to leave a disputed question; but that the hour has arrived to make a forward movement of a character so decided that the whole body shall be carried onward by the impetus, we do not hesitate to assert.

"There are other serious diseases which affect our flocks and herds besides cattle plague, and which will continue to flourish after the last traces of the pest have been eradicated; the lingering suspicion of its presence will often obscure the judgment, and cases of difficulty will frequently require prompt and satisfactory solution. During the last few months, indeed, we have had a foreshadowing of what is likely to happen. *It has often been a subject of comment, that while cattle plague was prevalent all other diseases were unknown. . . . It has not hitherto fallen to the lot of the members of the veterinary profession to deal with an emergency like that through which we have just passed; but, warned by their recent experience, they will incur universal and merited censure if they do not make themselves competent to act in the event of a similar crisis appearing. . . .*" (Our italics.)

It is no real consolation that compared with that of the elect of the veterinary profession the conduct of the medical profession during this critical time (as it had been during a similar visitation over a century earlier) was not very edifying (as is testified by Fleming, Hunting, and other writers).

It was not for long years afterwards that anything substantial was done to elevate veterinary education to the level presaged by *The Field*. Britain was only slowly to emerge from the "Era of Complacency." As Smith most rightly concludes (*Hist. Vet. Lit.*, *4*, 152) writing upon the genius of John Gamgee at this time, "*. . . He was a great man, utterly unappreciated in a country that sneered at science. Such can be the only verdict of posterity.*" [It is not unworthy of notice that it was during the great cattle plague epizootic John Gamgee first introduced the clinical thermometer into veterinary practice.]

It is abundantly clear, in any case, that after bringing into sharp focus the real origin of what is now in force to shield the livestock of Britain from the

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disasters which still beset stockraising in less fortunately situated countries, the meaning of Gamgee's "*influence*," and what it later entailed in the evolution of the British veterinary profession, stands in need of discussion in several respects.

At the risk of making the above narrative of a bygone epoch disjointed, preference has been given to reproducing the testimonies of several contemporary observers to summarising consecutively the abundance of material available recording the events of that epoch.

[At this stage, the writer would very much like to testify his gratitude to the publishers of this JOURNAL for their timely invitation to lay bare the outstanding achievements of the past century and in most particular to Mr. H. W. Eley, the Manager of the Journal, for his unfailing courtesy in meeting the writer's wishes in every way.]

(*To be continued*)

GENERAL ARTICLES

BILATERAL CHEILOSCHISIS ASSOCIATED WITH "WOLF SNOUT" IN A STILLBORN CALF

By M. A. A. EL HAGRI, F.R.C.V.S., B.Sc.(Edin.), D.V.M.S.(Egypt),
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THE frequent occurrence of anomalies in the region of the face has been related to the extremely complex nature of the developmental processes of this region. Aprosmus, micrognathus, cheiloschisis, and a good number of other malformations are instances of faulty development of the facial components. However, among the common anomalies which affect the face—in fact, the entire body—is the condition designated cheiloschisis or hare-lip. This anomaly may or may not be associated with other abnormalities, e.g., the condition frequently described as " wolf snout."

Material and Method

The Medical Officer of Roseries presented a malformed head and forelimbs of a stillborn calf to the Veterinary Inspector of the Blue Nile Province, Sudan, in 1947. In his report he pointed out that the lower jaw appeared to be like that of man and the nose had the form of a solid bone. He also added that each of the forelimbs possessed a single hoof and an extra joint. These specimens, preserved in a 10 per cent formalin solution, were sent to the Dean, Khartoum Veterinary School, by the Senior Veterinary Inspector, who reported the absence of any abnormality in the position or in the structure of the viscera of the stillborn calf. In the Anatomy Department of Khartoum Veterinary School, where I was in charge, examination of the specimens was carried out.

Prior to any dissection of the head, the external anatomical features were recorded and a photograph was taken to show the well-pronounced anomalies which were present. Dissection was then conducted to define the nature of

PLATE I

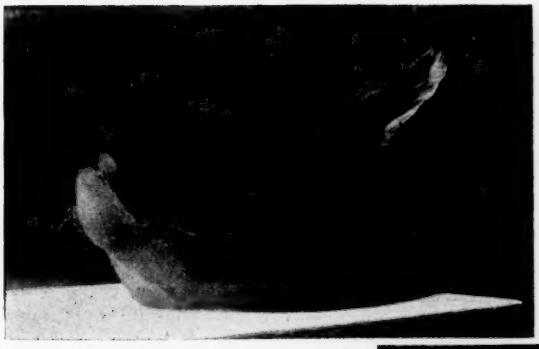

FIG. I

FIG. II

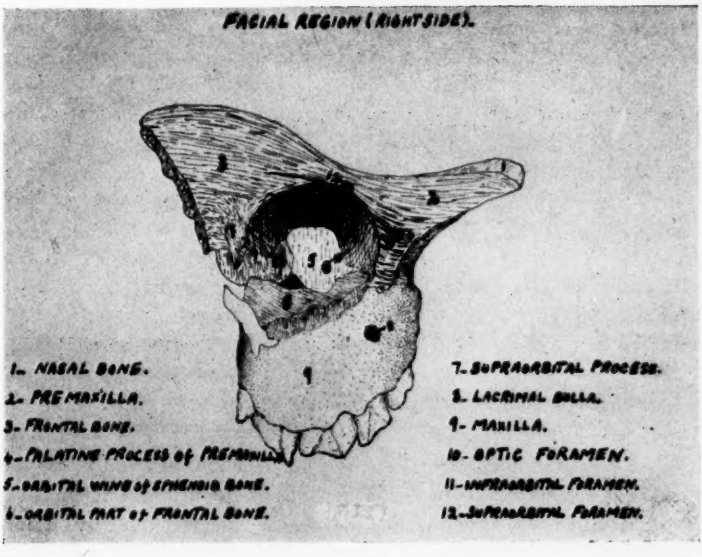

FIG. III

(*Article by Hagri, page* 334)

PLATE II

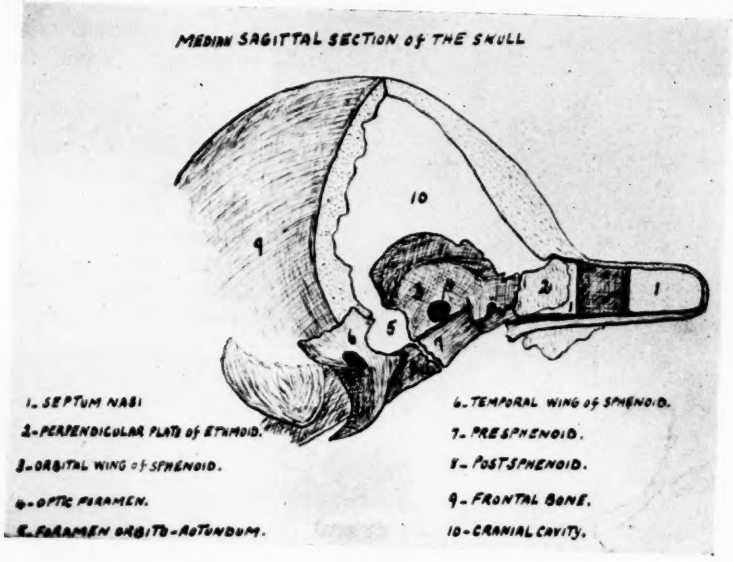

FIG. IV

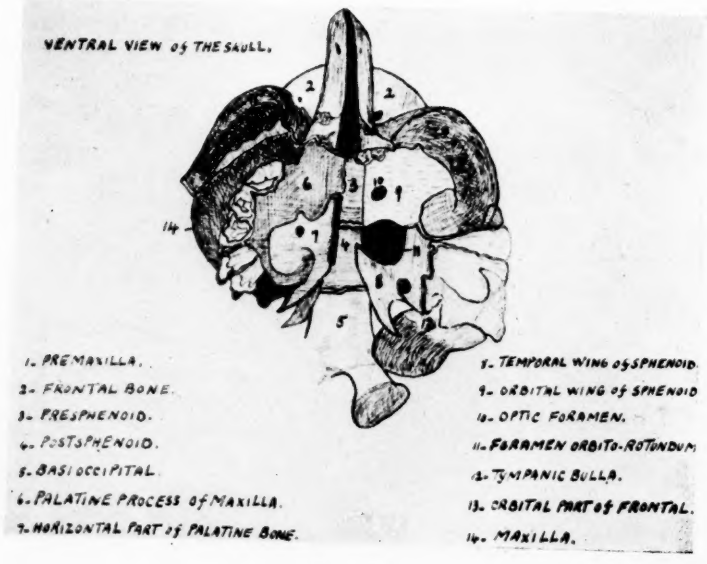

FIG. V

(*Article by Hagri, page* 334)

those abnormalities. This procedure was succeeded by the removal of all soft parts from the face and the base of the skull for the investigation of the state of development and relative positions of the facial components of the skull. Dissection of the limbs was confined to the subcarpal regions where extra joints were suspected.

Results

Superficial examination of the head of the calf revealed a pronounced developmental arrest of the upper jaw. This, together with a marked curvature of the lower jaw, resulted in a short and a blunt appearance of the face. The upper lip, which presented a cleft on either side, was also reduced both in size and extent so that its central part, popularly termed the muzzle, measured about an inch in height. Between those labial clefts, and springing from the anterior part of the forehead between the orbits, a somewhat pyramidal nose-like bony ridge projected forward and slightly downward for a distance of $1\frac{1}{2}$ inches beyond the surface of the face. When the mouth was made to close, the free blunt extremity of that nose-like structure rested on the floor of the mouth immediately caudal to the central incisors, while the right second intermediate and corner incisors fitted well into the corresponding labial cleft. On the left side of the mouth the gap was greater than on the opposite side, owing to the slight inclination of the nose-like structure to the right side. This allowed the protrusion of a great portion of the tongue from the mouth on the left side. (Fig. 1.)

All previous anatomical features pointed to a condition of bilateral cheiloschisis combined with "wolf snout."

These anomalies were further complicated by the lack of anterior nares or nostrils. Removal of the skin over the "wolf snout" has shown that it consisted of two laterally situated, thin, triangular plates of bone, each of which measured about $\frac{3}{4}$ inch in height. These plates articulated together by the caudal half of their dorsal borders, while in the rest of their length they were joined by an intercalated spicule of bone. This bone presented a caudal pointed extremity and a somewhat expanded cranial end. Ventrally, the lateral plates were joined together by a narrow, triangular bone which articulated caudally by its base with the palatine processes of the maxilla. (Figs. 2 and 3.)

Further examination of a median sagittal section of the skull revealed the presence of a minute cavity within the bony frame of the "-wolf snout." This cavity, which apparently resembled a nasal cavity in general appearance, hardly exceeded 4 mm. in width. It was further longitudinally subdivided by a thin plate of cartilage. This cartilagenous septum nasi was continuous caudally with the perpendicular plate of the ethmoid bone which was the only part of this bone that was present. However, this minute nasal cavity was not only lined by periosteum and perichondrium, but also contained no other structures, i.e., turbinates and ethmo-turbinates. (Fig. 4.)

Furthermore, the floor of this nasal cavity was formed by the palatine processes of the premaxilla only. The palatine processes of the premaxilla were represented by that triangular bone which united the lateral plates of the

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"wolf snout" ventrally as already described. It was also noticed that the posterior nares were lacking. This was found to be due to the direct contact of the horizontal part of the palatine bone to the body of the sphenoid. This was also the case with the palatine processes of the maxilla as evidenced by the examination of the base of the skull. (Fig. 5.)

Both palates were normal in structure.

With regard to the examination of the forelimbs, the presence of a single hoof in either limb was evidently due to reduction in the number of the functional digits. It is very interesting to notice that what has been suspected to be an extra joint on superficial examination was in reality a false joint. Dissection showed the presence of a simple comminuted fracture of the metacarpal bones distal to either of the carpal joints. The bony fragments were found to be held together by a fibro-cartilagenous tissue which gave the false impression of an extra joint.

Discussion

Different views have been put forward with regard to the production of hare-lip anomaly. Newman (1917) suggested the cause of monster production is the lowering of developmental rate. Stockard (1921) stated that apart from those anomalies which are admittedly hereditary, the primary causal factor of all abnormal development is metabolic arrest attributed to oxygen deficiency. Reed (1933), however, concluded from embryological observations in the mouse that hare-lip is due primarily to the failure of the lateral nasal processes and the medial nasal processes to fuse. This failure is probably in turn due to a retarded growth rate of the maxillary processes which fail to exert needed lateral pressure at the critical time. Steiniger (1941 a, b), on the other hand, suggested that some of the clefts are due to break-through of cysts, and that the bridges found later on are the vestiges of this process. He was also in agreement with Reed's (1933) statement that the failure of union of the nasal processes was the cause in other cases. Wooldridge (1934) mentioned that congenital fissure of the upper lip may be uni- or bilateral, and extends a variable distance into the lip. It may exist alone or be accompanied by cleft palate. Arey (1937) stated that hare-lip is usually unilateral and on the left side, but it may be double. Either the fleshy lip or the bony maxilla is involved separately, or both may participate. The explanation lies in the faulty fusion of the median nasal and maxillary processes. Sometimes hare-lip is also combined with cleft palate. According to Grüneberg (1947), inherited hare-lip and cleft palate in the mouse is almost an exact replica of the human condition. As in man, there are more clefts on the left side than on the right side, and more in males than in females. In extreme cases, a bilateral cleft extends from the upper lip through the premaxilla, just lateral to the upper incisors, throughout the whole length of the hard palate. Often this condition is hemilateral only, and in mild cases the lip only is split.

The literature available on the "wolf snout" condition is very meagre and of passing mention rather than a description of the anomaly. Arey (1937) stated that double hare-lip, whether accompanied by cleft palate or not, may

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result in the incisive bone projecting beyond the surface of the face; this defect is designated "wolf snout." Cunningham (1943) also mentioned that when hare-lip is double, the premaxillary part of the upper jaw is isolated and often develops into a projecting mass. Both authors, however, did not mention whether or not the development of the nasal cavity was implicated in the "wolf snout" anomaly. Attempts have been made to explain the existing anatomical defects in the light of the known embryological facts.

Since embryological studies have shown that the anterior nares develop around the olfactory pits, the absence of nostrils in the specimen may be attributed to the same cause. In normal embryonic development the premaxilla is formed by the union of the medial nasal processes, while the nasal bone and the septum nasi arise from the most median part between them of the fronto-nasal process of the embryo. In this "wolf snout" condition, one may assume that because of agenesis of the olfactory pits, the anterior part of the fronto-nasal process remained undivided into lateral and medial nasal processes. Consequently, lateral pressure would be exerted on the medial nasal processes followed by intimate union between the premaxilla and the nasal bones, as was the case in the specimen under investigation. In addition, the lack of olfactory epithelium in the minute nasal cavity is due to the failure of development of the olfactory placodes.

Summary

The anatomical features as found in bilateral cheiloschisis combined with "wolf snout" in a stillborn calf were described.

The available literature on cases of hare-lip anomaly was reviewed.

Possible explanations based on embryological facts which may have caused the anatomical defects have been attempted.

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STUDIES ON THE BLOOD OF DOGS

VII.—Hæmatological Findings in Dogs Suffering from Some Common Diseases (a) Rabies, (b) Tumours, (c) Spleen Infarction

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(a) Rabies

A Dog suffering from extreme emaciation and paralysis of the hind limbs was brought to the School hospital by its owner who suspected fracture of the thigh bones. The animal showed profuse salivation and difficulty in deglutition.

Blood samples were taken for examination. The dog died after 24 hours and post mortem examination revealed the following: congestion of the pharynx, larynx and stomach, which was empty and shrunken. The lungs and other internal organs were slightly congested. The brain and meninges were deeply congested and hæmorrhages occurred in the brain substance.

Rabies was suspected. The brain was sent to the Anti-Rabic Institute, Cairo, for investigation; and rabies was confirmed in due time.

The Blood Picture

The Red Cell Count and Hæmoglobin Amount

These were increased. The count amounted to 7,080,000 per c.mm. and the hæmoglobin measured 80 per cent.

The Colour Index was higher than normal, amounting to 0.60.

Reticulocytes amounted to 0.3 per cent.

Total Leucocyte Count. Leucopenia was recorded, the leucocytes amounting to 5,000 per c.mm.

Differential Leucocyte Count

No significant change was recorded in the presence of the neutrophiles or lymphocytes; the percentage of both amounted to 67 and 17, respectively. The eosinophiles relatively increased to 11 per cent; the monocytes, on the other hand, were reduced to 5 per cent. Basophiles were totally absent from the peripheral blood.

Schilling Index

Myelocytes and young forms of neutrophiles were not detected in the blood. Stab forms, however, were increased to 7 per cent. The segmented neutrophiles were slightly decreased and averaged 61 per cent.

Discussion

Courmont and Lesieur (1901) studied natural infection with rabies in three cases in man and five cases in the dog, as well as experimental cases

on dogs, guinea pigs and rabbits. They found the percetntage of the polymorphonuclears high in all cases, beginning in experimental cases with the appearance of symptoms. The total number of leucocytes was increased in nearly all cases. In experimental cases in dogs the total number of leucocytes increased suddenly on the appearance of symptoms, reaching 15,000 to 19,000 then falling somewhat on the day of death. The percentage of polymorphs exceeded 9 per cent from the time of appearance of symptoms to death. In experimental cases in rabbits and guinea pigs there was a neutrophilia from the time symptoms appeared and an increase in the number of leucocytes in some of the cases. In some there was no increase in the number of leucocytes, in a few there was a leucopenia.

Summary

The findings in this one case of natural infection are those of a high red cell count, hæmoglobin amount and colour index. Leucopenia was recorded with no significant change in the neutrophile and lymphocyte percentages. There was a marked relative increase in the eosinophiles with a slight decrease in the monocytes.

The neutrophiles showed a slight shift to the left as calculated by the Schilling Index.

(b) Tumours

Two cases of benign tumours were met with during this study. The first case was a tumour in a mammary gland of a bitch. The glands were enlarged and very much hardened. Post mortem, small and large, spherical or irregular multiple encapsulated hard tumours of greyish colour were found in the gland. On section they presented a cartilagenous appearance. Microscopically, connective tissue cells and fibres with islands of hyaline cartilage and a variable proportion of cells were seen in section. This case was diagnosed as chondrofibroma.

The second case was that of a bitch, the vagina and vulva of which were affected with multiple papillomatous tumours. They were rounded, pedunculated and whitish in colour. The tumour exhibited a roughened surface and a somewhat cauliflower arrangement. Microscopically, they consisted of an outgrowth of connective tissue containing blood vessels and covered with epithelial layers. Ulceration with suppuration was detected in the tumour. In the ovaries of the same bitch cystic tumours were also found. All tumours were of benign type.

Results and Observations

Red Blood Corpuscles

The red cell count was within normal range in both cases; it amounted to 5,750,000 and 5,600,000 per c.mm., respectively.

Hæmoglobin Percentage

This was lower in the first case and remained normal in the second, the percentage being 45 and 58, respectively.

Total Leucocyte Count

Leucocytosis was marked in both cases. It amounted to 22,600 in the first case. The second case had a count of 28,400 cells per c.mm. This is the highest count ever recorded in these present studies.

Differential Count

Neutrophilia was marked in both cases. The neutrophiles were present to the extent of 75 and 82.8 per cent of the total leucocytes.

The eosinophiles and lymphocytes were decreased while the basophiles were totally absent. The eosinophiles amounted to 4.5 and 2.6 per cent and the lymphocytes to 9.5 and 7.6 per cent per c.mm. for the two cases, respectively.

The monocytes were within normal range in the first case and decreased in the second; the percentage amounted to 11 and 7 per cent per c.mm.

Schilling Index

A moderate deviation to the left was recorded in the two cases. The stab forms were increased to 9 per cent in the first case and to 25.8 per cent in the second. Segmented cells were increased to 66 per cent in the first case and decreased to 57 per cent in the second.

Discussion

Kracke and Garver (1937) state that benign tumours are rarely accompanied by hypochromic anæmia or other change towards the anæmic state; for example, far advanced uterine fibroids are usually accompanied by anæmia, but this is brought about probably by the excessive uterine bleeding that accompanies the condition. A patient may present a lipoma or fibroma of tremendous size and yet exhibit no degree of anæmia whatever. On the other hand, squamous cell carcinoma of uterine cervix or of the skin, which may be only one-twentieth of the size of the benign tumour, may produce a profound degree of anæmia.

Pepper and Farley (1934) state that moderate leucocytosis occurred in many instances of neoplastic diseases as a result either of infection or of hæmorrhage. Sometimes the causative hæmorrhage occurs within the body of the tumour itself. Counts of 10,000 to 14,000 are common.

Summary

Two cases of benign tumours were examined. The red cell count and hæmoglobin percentage were within normal range.

Leucocytosis of neutrophilic type was markedly present, especially in the second case, in which suppuration occurred.

There was a moderate shift to the left in the neutrophile cells.

Spleen Infarction

On post-mortem examination of the dogs studied, hæmorrhagic and anæmic infarcts of the spleen were met with. They were single or multiple and varied in size from a mere point to half the organ. Healed up old lesions were evidenced by the presence of cicatrix.

The affected spleens were enlarged; the lesions were raised above the surrounding tissue. The infarcts were dark red, yellow or grey. On micro-

scopic examination of sections, the dark red raised areas were found to be filled with red blood corpuscles; the pale areas showed necrotic malpighian bodies. These were usually surrounded by a more or less congested outer zone with commencing formation of new connective tissue. Complete absorption of lesions with formation of cicatrix in varying degrees was often seen.

The Blood Picture

Red Blood Corpuscles

The red cell count was within normal range; it varied from 3,420,000 to 8,410,000 with an average of 5,550,000 per c.mm.

Hæmoglobin Percentage

The haemoglobin percentage was slightly reduced measuring from 40 to 63 per cent with an average of 55 per cent.

Colour Index

This was also slightly reduced to 0.50 ranging from 0.26 to 0.71.

Reticulocytes

These cells were increased to an average of 1.5 per cent, the maximum being 3.4 per cent.

Total Leucocytic Count

Slight leucopenia was recorded in these cases, the count averaging 11,280 and ranging from 7,000 to 18,800 cells per c.mm.

Differential Leucocyte Count

Neutrophiles: 64.9 per cent of the leucocytes belonged to the polymorphonuclears, they ranged between 49 and 81 per cent of the total leucocytes.

Eosinophiles: These were increased to 9.9 per cent ranging from 2.6 to 18.7 per cent.

Lymphocytes: These were also increased to 18 per cent ranging from 3 to 35 per cent.

Monocytes: These were reduced to 7 per cent ranging from 3 to 11.3 per cent.

Schilling Index

Myelocytes, juveniles as well as stabs, were increased to 0.1 to 0.8 and 9.6 per cent, respectively. The range for stabs was between 2.6 and 23 per cent of the total leucocytes. Segmented cells were increased to 54.4 per cent with a range between 36 and 73 per cent of the total leucocytes.

Summary

From the findings one concludes that in spleen infarction no significant change occurred in the red cell count and colour index; a reduction, however, occurred in the hæmoglobin percentage, the total leucocyte count, the neutrophiles and monocytes. An increase in the reticulocytes, basophiles, eosinophiles and lymphocytes was recorded. The Schilling Index showed a slight deviation to the left in the neutrophiles.

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REVIEWS

FARMING AND MECHANISED AGRICULTURE. Advisory editor—Sir R. George Stapledon, C.B.E., M.A., F.R.S. London: George G. Harrap & Co., Ltd. Price 25s.

THIS is the fourth editor of this "Whittaker" of agriculture. It is a reference book *par excellence* and should be always to hand. As an address-book of organisations, from Government Departments to the smallest Association or Society, it is alone invaluable. Its contents include a very full catalogue of books, periodicals and films, an unusual feature in a reference book; concise reports on the construction, objects and work of Government Departments and public and private bodies; up-to-date summaries of recent legislation; and a mass of statistical information relating to all branches of the agricultural industry. A list of artificial insemination centres with their addresses and staffs is another useful section. A most valuable book.

DISEASES OF POULTRY, by Ernest Grey, M.R.C.V.S. Grosby Lockwood. Price 12s. 6d.

IN this small book Grey set out to help those who keep poultry, and in this he does a good job.

The book is well printed; the large-size type does much to make the text easily read. The various drawings and photographs are also helpful.

In the first and second chapters the author talks about the normal healthy bird, which has much to commend it, because no one can appreciate the abnormal unless the normal is first of all understood. However, in chapter two the author mentions under the sub-heading "The Blood-cells," that the average number of red blood-cells is two to three million per cubic centimetre. Surely this ought to be per cubic millimetre?

The chapter on hygiene and sanitation contains many very simple but effective methods of keeping poultry healthy. In the later chapters the author repeatedly mentions the importance of proper hygiene and sanitation.

The rest of the books is concerned with disease, with a chapter on general and special pathology, followed by others dealing with diseases caused by viruses, bacteria, protozoa and metazoon parasites.

In the early part of the last chapter there is a kind of questionnaire which every poultry owner should find helpful for this method of instruction appeals to the layman. In another part of the same chapter there are some useful suggestions as to whom the poultry owner can turn to when in trouble with his poultry.

FOOD, FARMING AND THE FUTURE, by Friend Sykes. London: Faber & Faber. Price 21s.

THIS book is a sequel to Mr. Friend Sykes's "Humus and the Farmer," which stated with great clarity his beliefs based on a long practical experience. These are two, namely, that the soil is an organic living entity and not an

inert inorganic composition, and arising from that the health and fertility of plant and beast are dependent upon the maintenance of conditions in which the numerous organisms inhabiting the soil can live. In common with all members of the "organic school," of which he is to-day the most outstanding exponent, he holds that the use of "artificials" is not only unnecessary but actually the cause of ill-health both in plant and beast: this he has proved to his own satisfaction, and by example and precept he would have all others do as he has done, not because he seeks converts to a creed but in the interests of both public health and economics. It is no more costly, he claims, to farm without "artificials" than it is to farm with them, and the results are far more satisfactory.

There is little doubt that Medicine has been far too occupied with pathology, and that goes for human as well as veterinary Medicine, and too little concerned with the discovery of the cause of disease and its prevention. Mr. Sykes claims that if crops are properly nourished they do not contract disease, and that correctly-fed animals are invariably healthy. He never has to use any sprays or insecticides on his farm, and seemingly he rarely, if ever, has to call in a veterinary surgeon.

How all this is accomplished is fully described in his "Humus and the Farmer," and he now seeks in his present work to dot the i's and cross the t's of his first book. One could wish that he had been less discursive and not quite so repetitive and that he could have eliminated the so frequent use of the first person singular, but none the less he is always interesting and readable. It certainly behoves the veterinary surgeon to keep in close contact with humus farming and to watch closely the work which is being carried out by this school of thought, for there is more to it than just crankiness. The case may be overstated but no reform has ever been accomplished except by constant attack. It took a deal of persuasion to get the medical profession to listen to Lister, and Florence Nightingale's life's work to establish nursing. It may well be that in years to come our sons will look back with astonishment at the Herculean size of the task which was required to prove the simple truth that what a man (or beast or plant) eats, that he is. The evidence accumulates: the difficulty is to get the evidence studied, applied, checked, and cross-checked. This is a task for the veterinary profession, and the sooner it embarks upon it the better.

NEWS

NEW VETERINARY PRODUCT

MENLEY & JAMES, LTD., announce the introduction of "Vetiox" intramammary iodine, a preparation of iodine in oil for injection in the obstinate case of mastitis.

They state that long-standing infections, which have persisted in spite of penicillin treatment, have responded to "Vetiox" therapy, and it is of interest to note that, in addition to *Streptococcus agalactiæ* mastitis, "Vetiox" is also of value in udders which are infected with other streptococci such as *S. uberis* or *S. dysgalactiæ*, or with staphylococci.

It is issued in bottles of 200 c.c., price 5s. each including tax.

Literature will be sent to members of the veterinary profession on request.

NOTICE

WINTHROP PRODUCTS, LTD., an associate company of Bayer Products, Ltd., has recently been formed to promote the export of veterinary preparations. Mr. J. D. Chiswell (managing) and Mr. R. O. M. Edenborough have been appointed directors.

Publishers' Notices

THE BRITISH VETERINARY JOURNAL, with which is incorporated THE VETERINARY JOURNAL, is published monthly, and copy for advertisements should be in the hands of the advertisement manager not later than the 20th of the preceeding month, if proof is required. Tel.: Temple Bar 3386.

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